REMARKS/ARGUMENTS

Amendments to the Claims

In response to Examiner's objection made to claim 1 in the Office action dated April 2, 2008, the limitation "an arithmetic unit for processing the digital data" is amended to read "an arithmetic unit for processing the specific digital data". Claim 11 has been cancelled accordingly.

In addition, claim 1 has been amended to include all the limitations recited in claim 5 and certain limitations recited in claim 4 that are pertinent to the claimed feature recited in claim 5. Accordingly, claim 4 has been amended, and claim 5 has been cancelled.

Claim 13 has been amended to include all the limitations recited in claim 14. Accordingly, claim 14 has been cancelled. In addition, claim 15 has been amended to more clearly define the claimed limitation.

Claim 19 has been amended to include the limitations "a value of N varies in accordance with an absolute value of the long bit-length digital data, the value of N is reduced when the absolute value of the long bit-length digital data is increased, and the value of N is increased when the absolute value of the long bit-length data is reduced" similar to the limitations recited in the original claim 5.

Furthermore, claim 22 has been amended to include all the limitations recited in claim 28 and certain limitations recited in claim 27 that are pertinent to the claimed features recited in claim 28. Accordingly, claim 27 has been amended and claim 28 has been cancelled.

Claim Objections

Claim 1 has been amended to define that the arithmetic unit is used for processing the specific digital data. The applicant believes that the claim objection has been overcome.

Claim Rejections

Claims 1-3, 10-12, 22-26, and 29-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Narita in view of Nelson.

Claims 4, 6-9, 15-21, and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Narita and Nelson as applied to claim 3 above, and further in view of Urano.

5 **Response:**

Claims 1, 13, 19, and 22

Regarding claim 1, claim 1 has been amended to include part of the limitations recited in claim 4 to define that the jumping floating-point arithmetic is used to perform a magnifying shift to shift N bits of the long-bit length digital data,

10 and the applicant asserts that Urano fails to suggest the limitation "perform a magnifying shift to shift N bits of the long-bit length digital data". Rationale is given in the following. Referring to col. 4 lines 27-32 of Urano's disclosure, Urano explicitly teaches:

   At this time, a bit 1-bit upper than a radix point has its weight of 2^{-127}, and it is

15   *necessary to further shift the mantissa to right by 1 bit since a bit 1-bit upper*

   than the radix point in the denormalized number has its weight of 2^{-126} as

   shown in the equation (2).

That is to say, Urano merely teaches shifting a digital data **to right** by 1 bit. The applicant, however, points out that the phrase "magnifying shift" recited in claim

20 1 is to shift a digital data **to left** by some bits. An example of the magnifying shift is illustrated in the specification paragraph [para33] of applicant's disclosure as bellow:

   If the value 0x004444ffffff of 48-bit digital data is taken as an example, this

   number experiences a magnifying shift of eight bits, and the lowest 24 bits are

   eliminated. Finally the 24-bit digital data: 0x4444fc in regular jumping

25   *floating representation is accomplished after adding the tail mark "100".*

As the value 0x004444ffffff becomes 0x4444fc after the magnifying shift of eight bits, the magnifying shift of the applicant's disclosure is therefore used to shift a digital data to left by some bits. The applicant therefore asserts that Urano fails to teach the limitation "magnifying shift" recited in the amended claim 1.

30 With regard to claims 13 and 22, as stated in the above arguments of claim 1, the applicant asserts that Urano fails to teach the limitation "performing a magnifying

shift to shift N bits of the long bit-length digital data" respectively recited in claims 13 and 22.

In addition, claims 1, 13, and 22 have been amended to include the limitations recited in claims 5, 14, and 28 respectively. As indicated by Examiner in the section Allowable Subject Matter on page 12 of the Office action dated 04/02/2008, claims 5, 14, and 28 include claimed features found patentable over the cited references. The applicant asserts that the amended claims 1, 13, and 22 incorporating patentable features recited in claims 5, 14, and 28 respectively should have been placed in condition for allowance. As claim 19 has been amended to include the limitations similar to the limitations recited in claim 5, the applicant believes that amended claim 19 has been placed in condition for allowance as well.

In light of at least above reasons, the applicant believes that claims 1, 13, 19, and 22 should be allowable over the combined teaching of the cited references. Withdrawal of the rejections is respectfully requested.

Claims 7 and 16

Regarding claim 7, the applicant asserts that Urano fails to teach the limitations recited in claim 7. Referring to the teachings of Urano (col. 3 lines 33-40), the applicant points out that Urano teaches:

> *For example, at a format conversion from the 32-bit integer as an operand to the single-precision floating point number, when the operand is a negative value, it is made to an absolute value. When the operand is a positive value, it is judged whether a rounding procedure is executed according to a relation between the number of significant bits of the operand and that of the single-precision floating number to be obtained.*

Therefore, Urano teaches that it is determined whether a rounding procedure is executed by comparing the number of the bits of the operand (32-bit integer) with the number of the single-precision floating number to be obtained. In other words, Urano merely teaches comparing the **operand** with the single-precision floating number for determining **whether to execute a rounding procedure**.

The applicant, however, points out that limitations of claim 7 are directed to

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comparing **the sign bit of the long bit-length digital data** with other bits of the long bit-length digital data to determine **the shifting mode and the value of N**. The applicant contends that the operand of Urano is different from the applicant's sign bit, and determining whether to execute a rounding procedure is also different from determining the shifting mode and value of N as taught by applicant. Therefore, the applicant asserts that none of Narita, Nelson, and Urano teaches or suggests all the limitations recited in claim 7; claim 7 therefore should be found allowable over the combined teaching of the cited references. In addition, claim 7 is dependent upon claim 1, and should be allowed if claim 1 is allowed.

Moreover, claim 16 has the limitations similar to those recited in claim 7. In view of above arguments of claim 7, claim 16 should be found allowable over the combined teaching of the cited references. In addition, claim 16 is dependent upon claim 13, and should be allowed if claim 13 is allowed.

Claim 20

The applicant asserts that all the limitations recited in claim 20 are not taught by the combined teaching of Narita, Nelson, and Urano. Referring to the teachings of Urnao (col. 2 line 59 – col. 3 line 2), the applicant points out that the temporary exponent e1 is obtained from the exponent E of the operand in view of the exponent bias of both floating point numbers, and the flow of the format conversion procedures is controlled according to each case of the temporary exponent e1. That is, Urano teaches **calculating the temporary exponent e1** based on the exponent E of the operand and exponent bias of both floating point numbers and **controlling the flow of the format conversion procedures** according to the temporary exponent e1. Therefore, the applicant contends that the limitations "**determining a value of each bit in N bits** according to the sign bit; and **determining a value of each bit in the predetermined number of bits** according to the sign bit" recited in claim 20 are not taught by the combined teaching of Narita, Nelson, and Urano. In addition, claim 20 is dependent upon claim 19, and should be allowed if claim 19 is allowed.

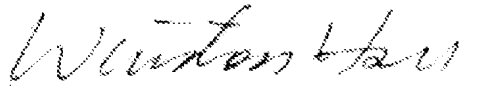Claims 2-4, 6, 8-10, 12, 15, 17, 18, 21, 23-27 and 29-33

5   Claims 2-4, 6, 8-10, 12 are dependent upon claim 1, and should be allowed if claim 1 is found allowable. Claims 15, 17, 18 are dependent upon claim 13, and should be allowed if claim 13 is found allowable. Claim 21 is dependent upon claim 19, and should be allowed if claim 19 is found allowable. Claims 23-27 and 29-33 are dependent upon claim 22, and should be allowed if claim 22 is found allowable.

Conclusion

10   Based on the above remarks/arguments, the applicant respectfully submits that all of the objections and rejections set forth in the Office Action dated 04/02/2008 have been overcome and all of the pending claims are now in condition for allowance. The applicant respectfully requests that a timely Notice of Allowance be issued in this case. If a telephone conference would facilitate the prosecution of this application, the Examiner is invited to contact the undersigned applicant's representative at the number indicated below.

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Sincerely yours,

_____   Date: _____ 06/30/2008 _____

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25   Note: Please leave a message in my voice mail if you need to talk to me. (The time in D.C. is 12 hours behind the Taiwan time, i.e. 9 AM in D.C. = 9 PM in Taiwan.)